Naval Support Activity Memphis
BRAC Cleanup Team Meeting Minutes
December 16-17, 1996

Monday, December 16
The meeting began at 1:00 p.m. in the NSA Memphis Environmental Division conference room. Attendees were:

David Porter, SOUTHDIV
Rob Williamson, NSA Memphis
Brian Donaldson, USEPA
Jim Morrison, TDEC
Jack Carmichael, USGS
Bill Parks, USGS
Lawson Anderson, E/A&H
Robert Smith, E/A&H
Larry Hughes, E/A&H
Ben Brantley, E/A&H

David Porter explained the purpose of this special BCT meeting was to resolve concerns about the proposed Hydropunch sampling outlined in E/A&H memos dated October 21 and November 18, 1996. The team agreed that the meeting would begin with a review of the background information used to prepare the proposed Hydropunch sampling investigation, including the conceptual model of apron area contamination (hereafter referred to as the conceptual model) prepared by Larry Hughes, the findings of the report prepared by the geostatistical analysis subcontractor (Newfields, Inc.), and comments by Frank Chapelle (USGS) following his cursory review of the apron area data at the natural attenuation symposium in Dallas, Texas. After reviewing the background information, a brainstorming session was planned to summarize "What We Know" and "What We Need To Know."

Larry Hughes began the background information review by distributing a memo entitled *Summary of Results to Date and Proposed Action, SWMU 7 and Apron Area Chlorinated Solvents in the Fluvial Unit, Naval Support Activity Memphis, Millington, Tennessee.* He then discussed each section of the memo up to the section entitled "Proposed Philosophical Approach" (with discussion of the remainder of the memo to take place after the brainstorming session). The lengthy discussion included a review of the evidence considered during development of the conceptual model, including structure maps, hydrogeology, time stability of flow, vertical flow, geochemical "fingerprinting" of contaminants, etc. Examples of each type of data considered

were passed around the table during the discussion. The primary features of the conceptual model were then described. These include numerous plumes with varying widths, different source chemicals, some plumes showing more evidence of biodegradation than others, stratification of plumes (some in upper fluvial deposits, some in lower, and some in both), and only one plume path has its northern extent defined which leaves a data gap to the north-northwest. The discussion of the conceptual model ended with the conclusion that the model is a hypothesis requiring testing, including the multiple plume and plume geometry concepts, and the assumed northern extent of contamination.

Lawson Anderson then read the "Summary" and "Conclusions and Recommendations" sections of the September 13, 1996, Newfields, Inc. report *Geostatistical Analysis of Groundwater Data at SWMU 7/Airfield Apron Area and Soil Lead Data at Turkey Shoot Area.* In general, the team found most of the conclusions acceptable, with the primary exception being conclusions related to the occurrence of aerobic and anaerobic degradation of volatile organic compounds (VOCs) in the fluvial deposits aquifer. While not disputing that it could be occurring, the general consensus was that Newfields' biodegradation conclusions were broad assumptions based on a literature search, rather than an analysis of groundwater data (the required data had not been collected at the time).

The team then summarized and discussed comments made by Frank Chapelle after his cursory review of the apron area data. As recalled by the team, his comments included:

- Concentrations detected do not indicate DNAPL.
- Bioattenuation may be occurring.
- A transect with vertical profiling was suggested to confirm absence of DNAPL.
- The benzene/petroleum plume would take care of itself and facilitate biodegradation of chlorinated compounds.
- There should be enough carbon in the fluvial deposits to facilitate natural attenuation.

A "sticky drill" or brainstorming session was then conducted with all persons present writing down examples of "What We Know" on individual pages from post-it note pads. These pages were then placed on the wall and sorted by the team into categories. The facts or statements in each category were then reviewed by the team to reach consensus that they were placed in the correct category. Category statements (Attachment 1) were then prepared to summarize the individual statements included in each category. The meeting then adjourned for the day.

Tuesday, December 17

The meeting resumed at 8:00 a.m. in the Environmental Division conference room. The same people were in attendance. Mark Taylor (SOUTHDIV) joined the meeting mid-morning.

The meeting began with a review of the results of Monday's "What We Know" brainstorming session. Several additional points were brought up, including:

- The nearest downgradient private fluvial deposits wells are greater than 3 miles (other side of Millington) from the base. Also, the Jones Orchard well (non-potable) is approximately 0.5-1 mile south of the South Gate.

- Fluvial deposits groundwater on base could be used by industry. Yield (< 10 gpm) would be a limiting factor and treatment might be required.

- The northern fault affects natural groundwater flow conditions. The interpreted leakage point is well off base (several miles) between North Fork Creek and Royster Creek. Based on data gathered to date, there are no known or interpreted leakage points on base.

The team then went through another sticky drill exercise to determine "What We Need To Know." Category statements were prepared (Attachment 2) and compared to the "What We Know" (Attachment 1) list. Discussion centered on the former Hangar N-6 area. Jim Morrison (TDEC) expressed concern that the relatively high contaminant concentrations (e.g., greater than 800 μg/L TCE in the upper fluvial deposits and greater than 20 μg/L carbon tetrachloride in the upper and lower fluvial deposits) were being "dismissed." USEPA also expressed concern about this area. E/A&H acknowledged the "high" contaminant concentrations in this area, and explained that there could be even more areas with high concentrations that have yet to be identified, as pointed out by Newfields, Inc. The proposed investigation rationale selected a single flowpath and/or area to represent all the different areas of contamination on the apron. The flowpath in the N-126 hangar area was selected for a number of reasons (including the fact that it had the highest concentrations detected to date) as a "worst case" scenario intended to be representative of all the plumes, including those in the N-6 area. It was also pointed out that selecting the N-126 flowpath as the worst case example was a matter of opinion that was open for discussion and debate (i.e., the proposed investigative strategy was a starting point for team discussion). Questions that need to be answered and possible investigative approaches for the N-6 area were listed and discussed (Attachment 3).

Dave Nielson of Mid-West Engineering Services, the Hydropunch vendor that demonstrated the technology in October, called to discuss the team's concerns about the quality of groundwater samples collected with Hydropunch techniques (e.g., possible adverse affects caused by backhammering/surging and the color of fluvial deposits samples indicating possible cross-contamination from the loess) . The following points were made:

- Nielsen stated that having to backhammer is normal in the Memphis area. Mid-West might be able to fabricate an oversized tip to facilitate loss of the expendable tip and reduce/eliminate the need for backhammering.

- Penetration depth of the sampler (below the terminal depth of the boring) can be increased to further separate the groundwater sampled from the water in the borehole.

- Nielson stated that Hydropunch samples and monitoring well samples could differ by an order of magnitude. He did not indicate whether Hydropunch results are typically lower or higher. The BCT later discussed collecting a Hydropunch sample adjacent to a monitoring well to compare results.

- Nielson described use of the *interface mode*, an alternative Hydropunch sampling method which involves a 3-foot screen and a bailer inserted through the MW rod. This sample collection method is primarily used for "floater" contaminants.

- Screen damage results from redriving, surging, and/or the tip falling off before the bottom of the hole is reached.

- References regarding use of the Hydropunch system by Mid-West are available. Specifically, Law Engineering in Kennison, GA was mentioned (contact: Jim Johnson).

- Augers used during demo were 4.25-inch hollow-stem; not tri-lock; 4-key, double bolt; cannot keep inside dry; could fill with potable water; and, use of O-rings is possible.

After the call, the general consensus of the team was that the quality of Hydropunch groundwater samples is still suspect. However, only two alternatives were noted — using a combination of Geoprobe (upper and middle fluvial samples) and rotasonic (lower fluvial deposits samples) technologies, and attaching dedicated tubing with terminal screens at different

intervals to PVC riser through rotasonic boreholes. Mobilization costs alone for a rotasonic rig would likely exceed the costs of Geoprobe or Hydropunch sampling.

Following the Hydropunch discussion, Larry Hughes reviewed the remainder of the most recent (December 16-17, 1996) memo describing the proposed Hydropunch sampling rationale. The goals of testing the contaminant conceptual model and confirming that natural attenuation is working were described, as was the rationale for selecting the flowpath to be used as the "worst-case" example. The objectives for placement and sampling intervals at each of the 10 proposed sampling locations were reviewed and discussed by the team.

The following adjustments to the proposed sampling locations were made:

- Location 1 was moved from the southeast corner of the suspected source area (former interim status hazardous waste storage facility and former hazardous waste accumulation point) to the northwest corner.

- A middle fluvial deposits sample was added at Location 2.

- It was noted that the Stratification Testing objective listed for Location 4 in Table 1 should have been under Location 5. Also, the Test Multiple Plume objective was added for Location 5.

- It was noted that MW-10 would be a good natural attenuation monitoring well.

- Locations 6 and 8 were moved so they would be 100 feet to each side of MW-10, forming an east-west transect for lower fluvial deposits monitoring. Location 7 was moved adjacent to MW-10 to provide middle and upper fluvial deposits samples to complement lower fluvial deposits samples from MW-10.

- Locations 9 and 10 were moved in closer to the apron to form a southwest-northeast transect with Locations 6, 7 (and MW-10), and 8.

Possible sampling locations for the N-6 area were then discussed. Several scenarios were described to sample the two most likely source areas (the underground waste tank and a former grassy area on the east side of the hangar) and also to facilitate location of downgradient point

of compliance wells. During this discussion, Ben Brantley suggested the use of groundwater modeling as an alternative to the Hydropunch sampling. Key points of the groundwater monitoring suggestion were:

- The model would make a very conservative assumption about the amount of DNAPL present to see what the system could handle (i.e., if a large slug were assumed, how far would it have to travel before it was attenuated to concentrations below MCLs).

- The model might be used to determine the point of compliance based on existing concentrations.

- The model might be used to back in to DNAPL concentrations, check reported release quantities, and simulate the contaminant conceptual model.

- The model selection would probably be based on the best fit for the site-specific geology.

The meeting adjourned with all in attendance in agreement that the feasibility of modeling in lieu of Hydropunch sampling should be determined. Brian Donaldson (USEPA) stated that he would run it by EPA groundwater specialists, and Ben Brantley/Lawson Anderson said they would discuss it with E/A&H groundwater modelers.

(Note: Since the meeting, the EPA groundwater specialist informed Brian Donaldson that modeling without better source information to calibrate the model was not recommended and that the proposed Hydropunch sampling was a good approach. E/A&H groundwater modelers came to the same conclusion. Though a decision was never reached as to whether the Hydropunch system would be used for sampling the lower fluvial deposits groundwater, it appears to be the only available screening technology. A memo describing the proposed Hydropunch strategy/rationale and reflecting the changes outlined above is being prepared for distribution to the BCT and project team.)